



Buffalo Pumps and Receivers

With Automatically Controlled Steam Pumps—
Power Pumps—Centrifugal Pumps



BUFFALO Automatic Feed Pumps and Receivers have been developed in various types with steam pumps (of several styles), triplex power pumps and centrifugal pumps, the last mentioned being used on low-pressure heating systems to return condensation to boiler where steam pressure is not sufficient to operate an ordinary steam pump. The triplex and centrifugal outfits are usually driven by small electric motors, automatically controlled, so as to obviate necessity for constant attendance, and require no more attention than do the usual patterns of steam pump outfits. All of these outfits are carefully built and finished. One object in feeding hot water where possible is to avoid strains on boilers; the second object, which is of greater importance, is the saving effected by returning hot water, which would otherwise go to waste. The following table taken from Kent's Engineering Handbook gives valuable data:

PERCENTAGE OF SAVING FOR EACH DEGREE OF INCREASE IN TEMPERATURE OF FEED WATER

Initial Temp. of Feed	Pressure of Steam in Boiler, Lbs. Per Sq. In. Above Atmosphere							
	0	20	40	60	80	100	120	140
60	.0894	.0883	.0876	.0872	.0867	.0864	.0862	.0859
80	.0910	.0898	.0891	.0887	.0883	.0879	.0877	.0874
100	.0927	.0915	.0908	.0903	.0899	.0895	.0892	.0890
120	.0945	.0932	.0925	.0919	.0915	.0911	.0908	.0906
140	.0963	.0950	.0943	.0937	.0932	.0929	.0925	.0923
160	.0982	.0968	.0961	.0955	.0950	.0946	.0943	.0940
180	.1002	.0988	.0981	.0973	.0969	.0965	.0961	.0958
200	.1022	.1008	.0999	.0993	.0988	.0984	.0980	.0977
210	.1033	.1018	.1009	.1003	.0998	.0994	.0990	.0987

EXAMPLE: A boiler, 80 pound pressure; feed water, 60°. What would be the saving, if without additional fuel the temperature of the feed water could be made 180°? The temperature difference— $180^{\circ} - 60^{\circ} = 120^{\circ}$. Now, according to the above table, percentage saving per degree is .0867. Therefore, total saving is $120 \times .0867 = 10.4\%$ of fuel expense.

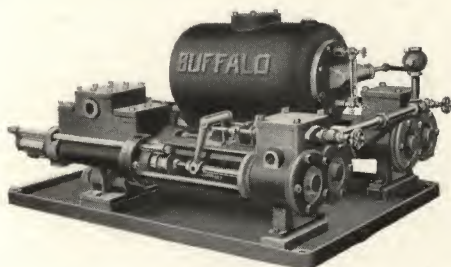


Fig. 715

Special Pump and Receiver outfit
Prices on application



BUFFALO PUMPS

CIRCULAR No. 244



Buffalo Duplex Automatic Feed Pumps and Receivers

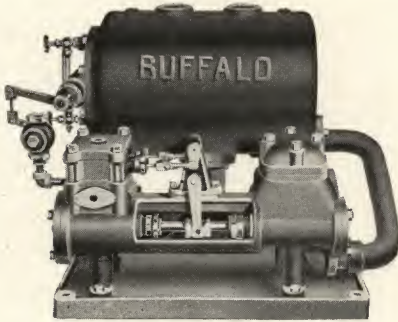


Fig. 712

Size, $4\frac{1}{2} \times 2\frac{3}{4} \times 4$

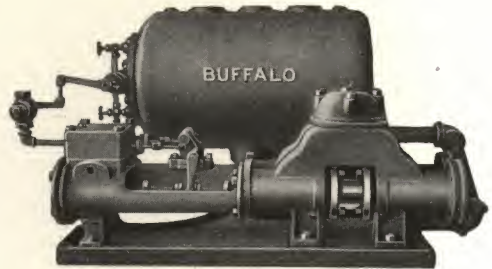


Fig. 714

Size, $4\frac{1}{2} \times 2\frac{3}{4} \times 4$

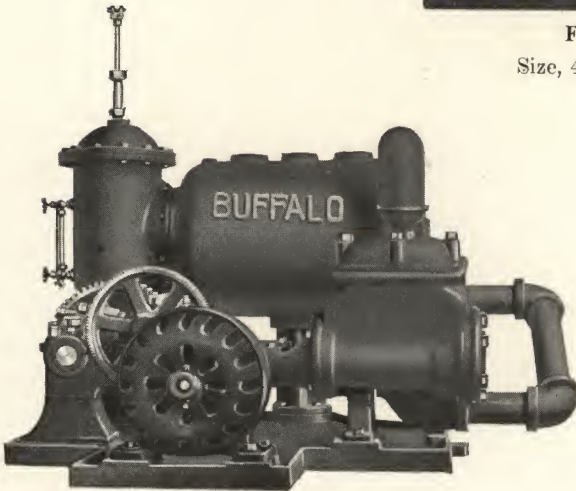


Fig. 717

Size, 4×6



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Buffalo Duplex Automatic Feed Pumps and Receivers

The unit consists of a suitably constructed cast-iron receiving tank, mounted in combination with a Boiler Feed Pump on a common bed plate. The tank is mounted slightly above the pump, giving a sufficient head of water above the suction valves to insure the pump always receiving a full supply of water.

Within the tank is provided a float connected to a chronometer valve controlling the steam supply to the pump. Inflowing water causes float to rise, thereby opening the steam supply and starting the pump. When the water level has been lowered, the float automatically cuts off the steam. In this way the condensation water is returned to the boiler as fast as it accumulates.

See page 5 for code to indicate electric current for motors on electric pumps and receivers.

Diameter Steam Cylinders	Diameter Water Pistons	Length of Stroke	Pump Capacity Galls. Minute	Sq. Feet Radiator Surface Apparatus Will Drain	Approximate Width and Length Inches	Number Openings in Receiver for Return Drip	Size Tapped Openings Top of Receiver for Return Drip	Regular	Brass
								Fitted	Fitted
								Code	Code
								Word	Word

With standard boiler feeders. Fig. 712

3	2	3½	10	5000	24 x 30	1	2½	<i>Dclpe</i>	<i>Dcnir</i>
4½	2¾	4	20	10000	32 x 46	2	2½	<i>Dclti</i>	<i>Dcnli</i>
5½	3½	5	40	20000	34 x 54	3	2½	<i>Deluv</i>	<i>Dcnov</i>
5½	3½	6	45	25000	34 x 54	3	2½	<i>Dclwp</i>	<i>Dcnsv</i>
6	4	6	60	40000	34 x 54	3	2½	<i>Delxo</i>	<i>Dcntu</i>
7	4	8	80	50000	40 x 65	3	2½	<i>Delyn</i>	<i>Dcnux</i>
7½	4½	8	100	60000	40 x 65	3	2½	<i>Dcmar</i>	<i>Dcnxy</i>

With low-steam pressure pumps. Similar to Fig. 712

3	1½	3½	6	3000	24 x 30	1	2½	<i>Dcmcy</i>	<i>Dcnyz</i>
4½	2	4	11	6000	32 x 46	2	2½	<i>Dcmha</i>	<i>Dcoct</i>
6	2	6	16	9000	34 x 54	3	2½	<i>Dcmle</i>	<i>Dcolf</i>
7½	2½	6	25	15000	38 x 56	3	2½	<i>Dcmov</i>	<i>Dcoms</i>

With outside center-packed pumps. Fig. 714.

4½	2¾	4	20	10000	32 x 52	2	2½	<i>Dcmpi</i>	<i>Dcorg</i>
5½	3½	6	45	25000	34 x 62	3	2½	<i>Dcmto</i>	<i>Dcosk</i>
6	4	6	60	40000	34 x 62	3	2½	<i>Dcmuw</i>	<i>Dcoth</i>
7½	4½	10	100	60000	30 x 94	3	2½	<i>Dcmxu</i>	<i>Depbt</i>

With power pumps. Fig. 717

	2	4	10	5000	Depends on Motor	1	2½	<i>Dcmvx</i>	<i>Dcpde</i>
	2¾	4	20	10000		2	2½	<i>Dcnas</i>	<i>Dcpfi</i>
	3½	6	45	20000		3	2½	<i>Denda</i>	<i>Dcpiv</i>
	4	6	60	40000		3	2½	<i>Dcnet</i>	<i>Deplo</i>
	4½	8	80	50000		3	2½	<i>Dcnhe</i>	<i>Dcpox</i>



BUFFALO PUMPS

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Buffalo Triplex Automatic Pumps and Receivers

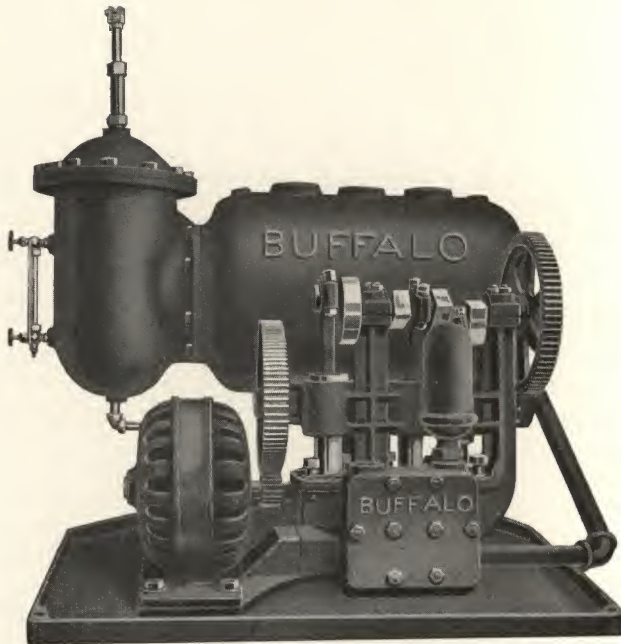


Fig. 1203

Size, 3 x 4, Single Acting Triplex Automatic Pump and Receiver



BUFFALO PUMPS

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Buffalo Triplex Automatic Pumps and Receivers

The purpose of these outfits is the same as of those already described. Many engineers prefer the single-acting triplex power pump for this service, and therefore we show these herewith. All receivers are of cast iron, strong enough to stand 50 pounds pressure. Standard outfits have regular size 40-gallon receivers, which are commonly used. Smaller sized receivers can be furnished if required. Larger size receivers are not desirable, as the accumulated water should be returned to boiler as promptly as possible before it loses temperature.

The general method of operation of all electric driven pumps and receivers is the same. The condensation collects in receiver tank, raising large seamless copper float, until at a maximum point the float, by its connection through a chain, closes the float-switch, and automatic starter starts the motor driving the pump. As the pump drains the receiver the float falls, until at a minimum point the float-switch is opened and the motor stops.

As the water handled by the pump is very hot, it is desirable that pump be brass fitted. The triplex pump is, of course, adapted to feeding direct into either high or low-pressure boilers with the greatest efficiency.

Inquiries should state square feet direct radiation (or its equivalent) to be drained, whether pump is to feed boiler direct and what the boiler pressure is and what elevation between pump and boiler is to be, with length and size pipe connecting same. If pump is not to feed direct into boiler, give details so head or pressure on pump can be estimated.

Also advise us electric current, using following code words:

Pump is to be direct connected to direct current or induction motor, as indicated by Code Word from following table:

Voltage	110	200-220	400-440	500-550
Direct Current	<i>Jcpat</i>	<i>Jcrav</i>	<i>Jcryc</i>	<i>Jcsuc</i>
25 Cycle, Single Phase, A. C. .	<i>Jcpev</i>	<i>Jcrew</i>	<i>Jcsaw</i>	<i>Jcsyd</i>
25 Cycle, 2 or 3 Phase, A. C. .	<i>Jcpox</i>	<i>Jcrix</i>	<i>Jcsex</i>	<i>Jctax</i>
60 Cycle, Single Phase, A. C. .	<i>Jcpuz</i>	<i>Jcroz</i>	<i>Jcsiz</i>	<i>Jclez</i>
60 Cycle, 2 or 3 Phase, A. C. .	<i>Jcpyb</i>	<i>Jcrub</i>	<i>Jcsob</i>	<i>Jctib</i>



B U F F A L O P U M P S

C I R C U L A R N o . 2 4 4



Buffalo Centrifugal Automatic Pumps and Receivers

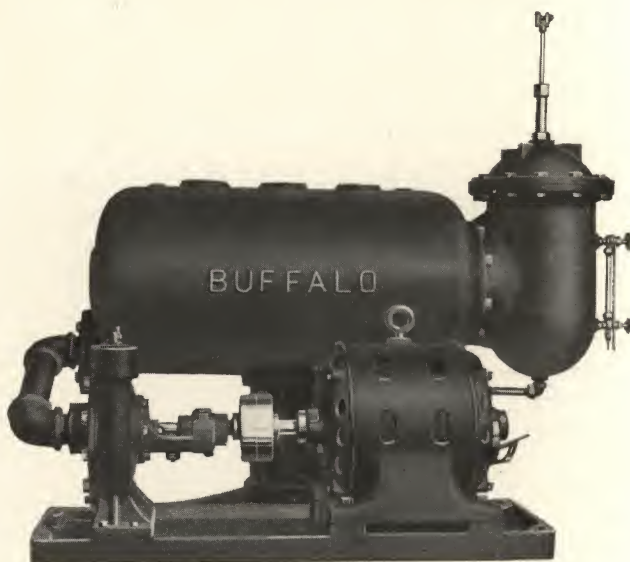


Fig. 1205

Size, 2", Centrifugal Automatic Pump and Receiver

NOTE:—For description and method of operation of automatic electric control see previous page.



Buffalo Centrifugal Automatic Pumps and Receivers

Centrifugal Pumps and Receivers are designed primarily for returning condensation from low-pressure systems into boilers, especially where steam pressure is so low as to prevent using ordinary steam pump and receiver outfits. The centrifugal pumps used by us are especially designed for handling hot water, are equipped with enclosed type polished brass runners or impellers and are suitable for hot water service. All receivers are of cast iron, strong enough to stand 50 pounds pressure. Outfits listed below are with standard size 40-gallon receivers, which are commonly used with these pumps. Smaller size receivers can be furnished if required. Larger size receivers are not desirable, as the accumulated water should be returned to boiler as promptly as possible before it loses temperature.

Inquiries should state square feet direct radiation (or its equivalent) to be drained, and total pumping head, including pipe friction to boiler so that pump will easily force water into boiler and *electric current* which will be used for motor. We will then make recommendations as to proper size outfit to use, choosing such size pump as, combined with motor at some standard motor speed, will do the work. The sizes listed below with code words are for convenience in telegraphic communication:

Outfit	Size Pump Discharge	Approximate Width and Length	Capacity Rec. Galls.	Number Openings in Receiver for Return Drip	Size Tapped Openings Top of Receiver for Return Drip	Code Word with Motor and Automatic Starter	Code Word without Electrical Equipment
A	1"	5' 6" x 3'	40	3	2½"	<i>Dcaft</i>	<i>Dcbfu</i>
B	1½"	5' 6" x 3'	40	3	2½"	<i>Dcalc</i>	<i>Dcbij</i>
C	2"	5' 6" x 3'	40	3	2½"	<i>Dcark</i>	<i>Dcbiy</i>
D	2½"	5' 6" x 3' 6"	40	3	2½"	<i>Dcbag</i>	<i>Dcbna</i>
E	3"	5' 6" x 3' 6"	40	3	2½"	<i>Dcbek</i>	<i>Dcbok</i>

Also advise us electric current, using following code words:

Pump is to be direct connected to direct current or induction motor, as indicated by Code Word from following table:

Voltage	110	200-220	400-440	500-550
Direct Current	<i>Jcpat</i>	<i>Jcraw</i>	<i>Jcryc</i>	<i>Jcsuc</i>
25 Cycle, Single Phase, A. C. .	<i>Jcpev</i>	<i>Jcrew</i>	<i>Jcsaw</i>	<i>Jcsyd</i>
25 Cycle, 2 or 3 Phase, A. C. .	<i>Jcpox</i>	<i>Jcrix</i>	<i>Jcsex</i>	<i>Jctax</i>
60 Cycle, Single Phase, A. C. .	<i>Jcpuz</i>	<i>Jcroz</i>	<i>Jcsiz</i>	<i>Jclez</i>
60 Cycle, 2 or 3 Phase, A. C. .	<i>Jcpyb</i>	<i>Jcrub</i>	<i>Jcsob</i>	<i>Jctib</i>

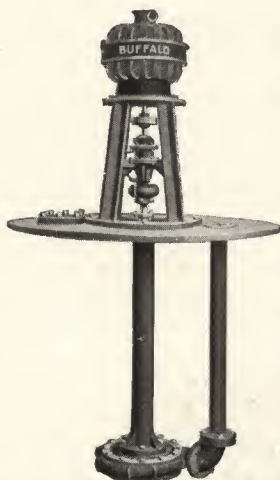


BUFFALO PUMPS

CIRCULAR NO. 244



Buffalo Automatic Sump Pumps



The success which has attended the operation of the hundreds of pumps of the type illustrated on this page is the very best recommendation the Buffalo Automatic Sump Pump could have.

To point out the difference between our pump and some of the cheaper, but less successful outfits, intended to perform similar work, we call attention to the following:

1. A self-contained outfit which on arrival needs only to be uncrated, connections to the automatic starter and motor made, and the unit is ready for operation.
2. Shaft is entirely enclosed and *really* is protected from action of sump water and possibility of fouling from waste or stringy matter flowing into sump pit.
3. Ball-bearing thrust is provided to carry weight of moving parts, lower ball race resting on spherical seat to permit it to adjust to conditions of alignment.
4. Oil—NOT GREASE—is used to lubricate this thrust. For intermittent operation at high speed nothing could be a poorer lubricant than grease, which is thrown away from the bearing surfaces by the rapid rotation and, owing to the fact that the pump operates for only a few minutes at a time to empty the sump, the grease does not get warmed up and become fluid enough to flow to the bearing surfaces.
5. Oil lubricant is supplied to the ball-bearing thrust automatically in a continuous flood while pump is in operation.
6. Stuffing-box and gland around shaft at cover plate prevent any steam, gases or foul odors rising into room, if edge of cover plate be caulked tight.
7. All parts of outfit easily accessible.

In sending inquiry state whether standard depth of 4-foot sump pit will be used, the total head against which the pump will operate, and what electric current is available to operate motor.

We are also pleased to quote on standard or special cast-iron pits with one or more inlets. Send sketch.

Maximum Gallons per Minute	Feet Total Operating Head	Code Word Pump Without Electrical Equipment	Code Words, Including Motor and Starter, Float, etc., for Various Currents not Including Cast-Iron Sump Pit. Pumps Designed for Standard Sump Pit 4 Feet Deep, with Cover Plates 3 Feet Diameter or 3 Feet Square.						
			110-Volt Direct Current	220-Volt Direct Current	550-Volt Direct Current	115-Volt or 230-Volt Single Phase 60-Cycle Alternating	440-Volt Single Phase 60-Cycle Alternating	100, 200 or 400-Volt 2 or 3 Phase 60-Cycle Alternating	100, 200 or 400-Volt 2 or 3 Phase 25 Cycle
60 (1½ inch disch'g)	10	Mrtal	Mrwos	Msbat	Msfoc	Mskad	Msmok	Msvan	Msrwv
	15	Mrtem	Mrwtw	Msbew	Msfud	Mskef	Msmul	Msvcp	Msrwa
	20	Mrtin	Mrwyo	Msbia	Msfyf	Mskig	Msmym	Msvir	Msrxy
125 (2½ inch disch'g)	10	Mrtop	Mrrap	Msbox	Msgaz	Mskoh	Msnah	Msvos	Mtats
	15	Mrtur	Mrrer	Msbuz	Msgcb	Mskuj	Msnaj	Msvut	Mtagt
	20	Mrtys	Mrris	Msbyb	Msgic	Mskyk	Msnik	Msvyv	Mtahv
200 (2½ inch disch'g)	10	Mrvam	Mrrot	Msdaw	Msgod	Mslaf	Msnol	Mswap	Mtakl
	15	Mrvrn	Mrrer	Msdcr	Msguf	Mslcg	Msnun	Mswcv	Mtalz
	20	Mrvip	Mrrya	Msdiz	Msgyg	Mslth	Msnyn	Mswis	Mtanf
275 (3 inch disch'g)	10	Mrvor	Msbat	Msdob	Msjac	Mslaj	Mstam	Mswot	Mtag
	15	Mrvus	Msbew	Msduc	Msjed	Msluk	Msten	Mswuv	Mtabb
	20	Mrvyt	Msbia	Msdyd	Msjif	Mslul	Mstip	Mswya	Mtabk
500 (4 inch disch'g)	10	Mrvan	Msbox	Msfar	Msjog	Msmay	Mstor	Msrar	Mtazp
	15	Mrvwp	Msbuz	Msfex	Msjuh	Msmeh	Mstus	Msrws	Mtbav
	20	Mrvir	Msbyb	Msfib	Msjui	Msmij	Mstyt	Msril	Mtbew

Larger size pumps, or for deeper sump pits, for higher heads or with special size covers, quoted on request